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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,974	04/05/2001	Gong Gu	SAR 13995	4112

28166 7590 02/18/2005

MOSER, PATTERSON & SHERIDAN, LLP
/SARNOFF CORPORATION
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

EXAMINER

TRINH, SONNY

ART UNIT

PAPER NUMBER

2687

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/826,974

Applicant(s)

GU ET AL

Examiner

Sonny TRINH

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 and 17-20 is/are allowed.
- 6) ☒ Claim(s) 12 is/are rejected.
- 7) ☒ Claim(s) 13-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claim 12 has been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claim 12** is rejected under 35 U.S.C. 102(e) as being Auranen ("Auranen"; U.S. Patent Application Publications Number 2003/0012305 A1).

Regarding **claim 12**, with reference to figures 2, 4-5 and descriptions, Auranen discloses an image-reject mixer comprising a first mixer (figure 2, mixer 204) having a first filter (208) and a local oscillator (206) input; a second mixer (205) having a second filter (209) and a LO input; and commutating circuitry for commutating said LO inputs of said first mixer and said second mixer between in-phase and quadrature phases (see also figure 5 and paragraph [0085]).

Allowable Subject Matter

3. Claims 1-11, 17-20 are allowed.

The following is an examiner's statement of reasons for allowance:

The present invention relates to an image rejection mixer which includes first and second branches, each having first and second stage mixers for converting the frequency of a desired channel to an intermediate frequency (IF) and rejecting the image channel. The local oscillator (LO) ports of all the mixers are commutated between quadrature and in-phase LO signals, and the output of the branches are commutated between each other, by two complementary, 50% duty cycle clock signals. The commutating image-reject mixer exhibits improved immunity to amplitude and phase mismatches that may be present in each branch.

The closest prior art, Bertoni et al. (U.S. 6,625,222) shows an adaptive image reject mixer including the in phase and quadrature component signals which resulted by applying the sine and cosine of the desired downstream center frequency. However, Bertoni fails to disclose a "...a first mixing branch having a first plurality of mixers, each of said first plurality of mixers having a local oscillator (LO) input; a second mixing branch having a second plurality mixers, each of said second plurality of mixers having a LO input; a combiner for generating an intermediate frequency (IF) signal from the outputs of said first and second mixing branches; and commutating circuitry for commutating said LO inputs of each of said first plurality of mixers and

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each of said second plurality of mixers between in-phase and quadrature phases, and for commutating the outputs of said first and second mixing branches between each other..."

This distinct feature has been added to independent claim 1 and renders it allowable.

Claims 2-6 are allowed by virtue of their dependency on claim 1.

Regarding **claim 7**, Bertonis also fails to disclose "...an image-reject mixer comprising a first mixing branch having a first plurality of mixers; a second mixing branch having a second plurality mixers; a combiner for generating an intermediate frequency (IF) signal from the outputs of said first and second mixing branches; and commutating circuitry for commutating each of said first plurality of mixers and each of said second plurality of mixers between each other, and for commutating the outputs of said first and second branches between each other...".

Claims 8-11 are allowed by virtue of their dependency on claim 7.

Regarding **claim 17**, the prior art of record also fails to disclose "...a method of rejecting an image signal comprising mixing a radio frequency (RF) signal with a first local oscillation (LO) signal to generate a first intermediate frequency (IF) signal; mixing said first IF signal with a second LO signal to generate a second IF signal; and commutating said first and second LO signals between in-phase and quadrature phases..." .

Claims 18-20 are allowed by virtue of their dependency on claim 17.

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4. **Claims 13-16** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding **claim 13**, the prior art fails to teach the commutating circuitry generates two complementary 50% duty cycle clock signals for commutating said LO inputs of said first mixer and said second mixer between in-phase and quadrature phases.

Regarding **claim 15**, the prior art provided numerous examples of image reject mixer, but failed to disclose or fairly suggest the specific combination of structural and functional limitations set forth in claim 15, specifically, wherein said commutating circuitry couples a LO signal that is commutated between in-phase and quadrature phases to said LO inputs of said first mixer and said second mixer.

Regarding **claim 16**, the prior art fails to teach that the image-reject mixer of claim 12 further comprising a commutating mixer for modulating the output of said second filter by the difference between said complementary clock signals.

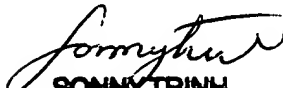
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sonny TRINH whose telephone number is 703-305-1961. The examiner can normally be reached on Monday-Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester KINCAID can be reached on 703-306-3016. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


SONNY TRINH
PRIMARY EXAMINER

2/14/05